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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/552,541	12/13/2006	Shuji Sakuma	3462.1016-000	6669

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EXAMINER	
KENNEDY, NICOLETTA	

ART UNIT	PAPER NUMBER
4131	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/552,541	SAKUMA ET AL.	
	Examiner	Art Unit	
	NICOLETTA KENNEDY	4131	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 April 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☒ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/13/2006 and 5/8/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Status of Claims

Claims 1-18 are currently pending.

Priority

This application, filed December 13, 2006, is a national state entry of PCT/JP05/02771 filed February 22, 2005, and claims foreign priority to Japanese application 2004-294740, filed on October 7, 2004. Applicants have provided not provided a certified copy of the Japanese application nor does the file wrapper contain a copy of the priority document from the International Bureau.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 4,7,13 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. These claims state that the preparation has a hydroxyapatite content of 0.1% to 1000% based on a drug to be combined. This limitation is not explained in the specification. For purposes of examination, the Examiner is presuming that the range of 0.1% to 1000% is based on a ratio of the hydroxyapatite to the drug (i.e. 1000% is a 10 to 1 ratio of hydroxyapatite to the drug). Appropriate correction or clarification is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Kumpta et al. (US 2003/0219466).

Kumpta et al. teach that a formulation comprising hydroxyapatite and another ingredient, such as a vaccine (abstract and para. 67). The formulation may be delivered transdermally (para. 66).

5. Claims 10 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Amerongen et al. (US 5,443,832).

Regarding claim 10, Amerongen et al. teach that a hydroxylated calcium phosphate (hydroxyapatite) particulate is a particularly useful carrier for antigens to be applied to mucosal surfaces of mammals (column 2, lines 40-44).

Regarding claim 17, Amerongen et al. teach that the ingredient to be absorbed through the mucous membrane is a vaccine (claim 1).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amerongen et al. (US 5,443,832) read in view of Kumta et al. (US 2003/0219466).

Regarding claim 1, Amerongen et al. teach that a hydroxylated calcium phosphate (hydroxyapatite) particulate is a particularly useful carrier for antigens to be applied to mucosal surfaces of mammals (column 2, lines 40-44). However, Amerongen et al. fail to teach whether the formulation can be absorbed transdermally. Kumpta et al. cures this deficiency.

Kumpta et al. teach a method of manufacturing hydroxyapatite and uses therefor in delivery of nucleic acids (title). Kumpta et al. further teach that the hydroxyapatite complex can be used transdermally

Regarding claims 2-3, Amerongen et al. teach that the hydroxylated calcium phosphate has a particle size of about 0.01 to 0.1 micron (claim 6). MPEP 2144.05 states that "[i]n the case where the claimed ranges 'overlap or lie inside ranges disclosed by the prior art' a *prima facie* case of obviousness exists" quoting *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). Here, the recited claim ranges overlap the range disclosed by Amerongen et al. and therefore, the ranges are prima facie obvious.

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Amerongen et al. with those of Kumpta et al. because transdermal absorption of hydroxyapatite would have been obvious to try. Amerongen et al. teach that hydroxyapatite may be transmucosally absorbed. For transmucosal absorption, the formulation must pass through epithelial tissue. Epithelial tissue is also a component of skin. Therefore, it would have been obvious to try using hydroxyapatite for transdermal absorption.

10. Claims 4-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amerongen et al. (US 5,443,832) read in view of Kumta et al. (US 2003/0219466) as applied to claims 1-3 above and further in view of Yanagawa (US 5,603,943).

11. The combination of Amerongen et al. and Kumpta et al. teach each limitation of claims 1-3 but fail to teach the hydroxyapatite content in the preparation. Yanagawa cures this deficiency.

Regarding claims 4 and 7, Yanagawa teaches a nasally administrable composition comprising hydroxyapatite as the preferred carrier (abstract and column 3,

lines 54-59). Yanagawa further teaches that the carrier may be present from 70% to approximately 99.995% by weight of the preparation. Thus, if the carrier is present at 70%, the drug is present at 30% and the carrier has a content of approximately 233% based on the drug to be combined. If the carrier is present at 90%, the drug is present at 10% and the carrier has a content of approximately 900%. MPEP 2144.05 states that "a prior art reference that discloses a range encompassing a somewhat narrower claimed range is sufficient to establish a prima facie case of obviousness" quoting *In re Peterson*, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382-83 (Fed. Cir. 2003). Thus the ranges claimed in claims 4 and 7 are prima facie obvious.

Regarding claims 5 and 8, Amerongen et al. teach that the ingredient to be absorbed is a vaccine (claim 1). Yanagawa teaches that the ingredient to be administered nasally may be an antidepressant, antiepileptic, antidiabetic, antiallergic, and others (claim 14). Kumpta et al. teach that the ingredient to be absorbed may be a vaccine (para. 67).

Regarding claims 6 and 9, Kumpta et al. teach that the dosage form may be an *ointment*, salve, balm, *lotion*, capsule, tablet, *liquid*, or other suitable dosage form known in the art (para. 66).

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Amerongen et al. and Kumpta et al. with those of Yanagawa because there is a motivation in the knowledge generally available in the art to know the ratio of carrier to drug. Amerongen et al. teach that

hydroxyapatite is a particularly useful carrier but do not teach the ratio of hydroxyapatite to drug. Yanagawa does teach the ratio for administration of drugs.

12. Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amerongen et al. (US 5,443,832).

Regarding claim 10, Amerongen et al. teach that a hydroxylated calcium phosphate (hydroxyapatite) particulate is a particularly useful carrier for antigens to be applied to mucosal surfaces of mammals (column 2, lines 40-44).

Regarding claims 11-12, Amerongen et al. teach that the hydroxylated calcium phosphate has a particle size of about 0.01 to 0.1 micron (claim 6). MPEP 2144.05 states that "[i]n the case where the claimed ranges 'overlap or lie inside ranges disclosed by the prior art' a *prima facie* case of obviousness exists" quoting *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). Here, the recited claim ranges overlap the range disclosed by Amerongen et al. and therefore, the ranges would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made.

13. Claims 13-16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amerongen et al. (US 5,443,832) as applied to claims 10-12 above, and further in view of Yanagawa (US 5,603,943).

Amerongen et al. teach each limitation of claims 10-12 but fail to teach the hydroxyapatite content in the preparation. Yanagawa cures this deficiency.

Regarding claims 13 and 16, Yanagawa teaches a nasally administrable composition comprising hydroxyapatite as the preferred carrier (abstract and column 3,

lines 54-59). Yanagawa further teaches that the carrier may be present from 70% to approximately 99.995% by weight of the preparation. Thus, if the carrier is present at 70%, the drug is present at 30% and the carrier has a content of approximately 233% based on the drug to be combined. If the carrier is present at 90%, the drug is present at 10% and the carrier has a content of approximately 900%. MPEP 2144.05 states that "a prior art reference that discloses a range encompassing a somewhat narrower claimed range is sufficient to establish a prima facie case of obviousness" quoting *In re Peterson*, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382-83 (Fed. Cir. 2003). Thus the ranges claimed in claims 13 and 16 are prima facie obvious.

Regarding claim 14, Amerongen et al. teach that the ingredient to be absorbed through the mucous membrane is a vaccine (claim 1). Yanagawa teaches that the ingredient to be administered nasally may be an antidepressant, antiepileptic, antidiabetic, antiallergic, and others (claim 14).

Regarding claims 15 and 18, Amerongen et al. teach that the preparation is administered as a suspension, capsule, or suppository and that it may be applied directly to oral, nasal, rectal, and vaginal surfaces (column 5, lines 36-46).

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Amerongen et al. with those of Yanagawa because there is a motivation in the knowledge generally available in the art to know the ratio of carrier to drug. Amerongen et al. teach that hydroxyapatite is a particularly useful carrier but do not teach the ratio of hydroxyapatite to drug. Yanagawa does teach the ratio of hydroxyapatite to administer drugs.

Conclusion

No claims are allowable.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NICOLETTA KENNEDY whose telephone number is (571)270-1343. The examiner can normally be reached on Monday through Thursday 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Nolan can be reached on 571-272-0847. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/NICOLETTA KENNEDY/
Examiner, Art Unit 4131

/Patrick J. Nolan/
Supervisory Patent Examiner, Art Unit 4131